3.7 AIR QUALITY, GREENHOUSE GASES AND CLIMATE CHANGE

This section describes the potential air quality impacts in the vicinity of the Broad Beach Restoration Project (Project), and the potential effects of Project-generated air pollutant emissions on public trust resources and values.

3.7.1 Environmental Setting Pertaining to the Public Trust

Broad Beach Restoration Area Location and Description

The Broad Beach Restoration Area (Project area) encompasses approximately 44 acres extending laterally for more than 6,700 feet from Lechuza Point to Trancas Creek Lagoon, including both public trust lands and adjacent private lands that support residential uses. Additionally, it includes the Zuma Beach parking lot adjacent to Trancas Creek, proposed for temporary construction staging.

Regional emissions in the vicinity of the Project area are dominated by mobile sources, specifically associated with motor vehicles and marine vessels in the offshore shipping lanes. The Project area is not located near any major industrial source of air pollutant emissions.

Off-site Project Areas Location and Description

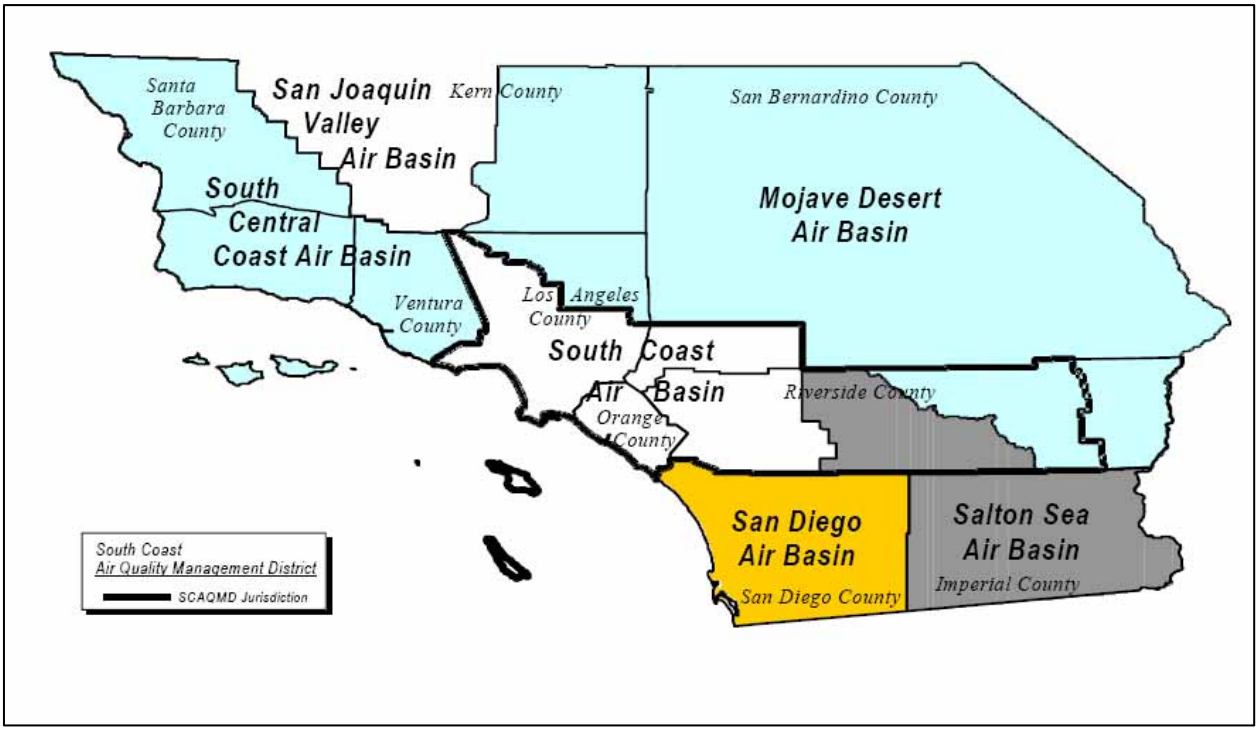
The Off-site Project areas include areas of both potential direct and indirect Project impacts. Off-site Project areas subject to potential direct Project impacts to air quality include the Trancas Sediment Deposit, the Ventura Harbor sand trap, and the Dockweiler borrow site as well as the sand transportation routes between these sites and the Project area. The Off-site Project areas subject to potential indirect Project impacts includes the State tidelands and beaches in the vicinity of the borrow sites and sand transportation routes.

Similar to the regional emissions in the vicinity of the Project area, emissions in the vicinity of this area are also dominated by mobile sources, specifically those associated with motor vehicles and marine vessels in the offshore shipping lanes.

Regional Climate

California is divided into air basins, which are served by either individual or multi-county air pollution control districts (APCD) or air quality management districts. The Project is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD consists of the South Coast Air Basin (SCAB), which includes portions of Los Angeles, Riverside, and San Bernardino counties and all of Orange county. Figure 3.7-1 shows the SCAB, which is bound by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east.

Figure 3.7-1. SCAQMD Jurisdiction



Source: SCAQMD 2007.

A semi-permanent, subtropical, Pacific high-pressure system dominates the vicinity of the Project area, as well as the Off-site Project areas. Generally mild, cool sea breezes temper the climate; nonetheless, periods of extremely hot weather, passing winter storms, or dry offshore Santa Ana winds occasionally interrupt this mild climate.

Winters are seldom cold, frost is rare, and minimum temperatures average between 44 and 59 degrees Fahrenheit (°F). Spring days may be cloudy due to high fog. Rainfall averages about 13.7 inches per year, falling almost entirely from late October to early April (see Table 3.7-1).

Seasonal and diurnal wind regimes affect air transport in the vicinity of the Broad Beach Restoration Area. Diurnal sea-breeze drainage flow typically dominates the local wind pattern. The SCAQMD is characterized by frequent, strong, elevated inversions. These inversions, created by atmospheric subsidence, severely limit vertical mixing; therefore, they promote the buildup of pollution, especially in the late morning and early afternoon.

Table 3.7-1. Average Monthly Temperatures and Precipitation at Malibu 1961-1990

Month	Mean Monthly Temperatures		Total Precipitation (inches)
	Maximum (°F)	Minimum (°F)	
January	66	45	56
February	66	46	56
March	66	47	57
April	68	48	58
May	69	52	61
June	72	55	64
July	74	58	66
August	75	59	67
September	75	59	67
October	73	54	64
November	70	48	59
December	67	44	56
Annual Average	70.1	51.3	60.9

Source: NCDC 2012.

Existing Air Quality

Pollutants that impact air quality are generally divided into two categories: criteria pollutants and toxic air contaminants. Criteria pollutants are air pollutants which are associated with numerous health effects including increased respiratory symptoms and hospitalization for heart or lung disease and are regulated by health-based ambient standards. Toxic air contaminants are air pollutants which may cause or contribute to an increase in mortality or an increase in serious illness. Toxic air contaminants are regulated by minimizing exposure to the lowest extent feasible.

Criteria Pollutants

Comparisons of contaminant levels in ambient air samples to national and State standards determine whether a region's air quality is healthy or unhealthy. The U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) set these standards to protect public health and welfare with an adequate margin of safety. The Federal Clean Air Act of 1970 first authorized National Ambient Air Quality Standards (NAAQS). The State legislature authorized California Ambient Air Quality Standards (CAAQS) in 1967.

State and Federal health-based air quality standards in California regulate the following criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). California also regulates sulfate, visibility reducing particles, hydrogen sulfide (H_2S), and vinyl chloride.

However, H_2S and vinyl chloride are currently not monitored in the SCAQMD because these contaminants are not common air quality problems in the basin. CAAQS and NAAQS for each of these pollutants and their effects on health are summarized in Table 3.7-2.

Table 3.7-2. Ambient Air Quality Standards

Air Pollutant	Concentration and Averaging Time		Most Relevant Effects
	State Standard	Federal Primary Standard	
Ozone (O_3)	0.09 ppm[1], 1-hr. average 0.07 ppm, 8-hr. average	0.075 ppm, 8-hr. average	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals, (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage.
Carbon Monoxide (CO)	20 ppm, 1-hr. Average 9.0 ppm, 8-hr. average	35 ppm, 1-hr. Average 9.0 ppm, 8-hr. Average	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses.
Nitrogen Dioxide (NO_2)	0.18 ppm, 1-hr average 0.03 ppm, annual average	0.053 ppm, annual average	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration.
Sulfur Dioxide (SO_2)	0.25 ppm, 1-hr. average 0.04 ppm, 24-hr average	0.14 ppm, 24-hr average 0.03 ppm, annual average	(a) Bronchoconstriction accompanied by symptoms that may include wheezing, shortness of breath, and chest tightness during exercise or physical activity in persons with asthma.
Suspended Particulate Matter (PM_{10})	50 µg/m_3[2], 24-hr average 20 µg/m^3, annual arithmetic mean	150 µg/m^3, 24-hr average	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Excess seasonal declines in pulmonary function, especially in children.
Suspended Particulate Matter ($PM_{2.5}$)	12 µg/m^3, annual arithmetic mean	35 µg/m^3, 24-hr average 15 µg/m^3, annual arithmetic mean	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Excess seasonal declines in pulmonary function, especially in children.
Sulfates	25 µg/m^3, 24-hr average	Not applicable	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardiopulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage.

Table 3.7-2. Ambient Air Quality Standards (continued)

Air Pollutant	Concentration and Averaging Time		Most Relevant Effects
	State Standard	Federal Primary Standard	
Lead	1.5 µg/m^3, 30-day average	1.5 µg/m^3, calendar quarter	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction.
Visibility-Reducing Particles	In sufficient amount to reduce the visual range to less than 10 miles at relative humidity less than 70%, 8-hour average (10am - 6pm)	Not applicable	Visibility impairment on days when relative humidity is less than 70 percent.
Hydrogen Sulfide	0.03 ppm, 1-hr. average >	No Federal Standard	Odor annoyance.
Vinyl Chloride	0.01 ppm, 24-hr average>	No Federal Standard	Known carcinogen.

Source: SCAQMD 2009.
Note: By convention, metric units are most commonly used to describe pollutant concentrations in the air.
[1] ppm - parts per million (by volume)
[2] µg/m^3 - micrograms per cubic meter (of air)

The Broad Beach Restoration Area is located near the SCAQMD Northwest Coastal Los Angeles county monitoring station. Recent background air quality data for criteria pollutants for this monitoring station, located approximately 23 miles northeast of the Broad Beach Restoration Area in West Los Angeles, are presented in Table 3.7-3. Ambient air quality was compared to the most stringent of either the CAAQS or NAAQS. These monitored data indicate that the Northwest Coastal Los Angeles county area is in compliance with the CO, NO_2, SO_2, sulfates and lead standards for both the CAAQS and NAAQS, and the CAAQS sulfate standard.

State O_3, PM_{10}, and $PM_{2.5}$ air quality standards were exceeded at the Northwest Coastal Los Angeles county air monitoring station on some days during 2007 through 2010 (see Table 3.7-3). The 8-hour ozone standard was exceeded on 1 day in 2007. The PM_{10} standard and the $PM_{2.5}$ standard were exceeded in 2007.

Toxic Air Contaminants

The California Health and Safety Code defines a toxic air contaminant (TAC) as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health. Under California's TAC program, the CARB, with the participation of the local air pollution control districts, evaluates and develops any necessary control measures for toxic air contaminants. The general goal of regulatory agencies is to limit exposure to TAC to the maximum extent feasible.

Table 3.7-3. Background Air Quality Data for the Northwest Coastal Los Angeles County Monitoring Station (Area 2) 2007-2010

Constituent	Maximum Observed Concentration (Number of Standard Exceedances - most restrictive)					
	State Standard	Federal Standard	2007	2008	2009	2010
Carbon monoxide						
1-hour	20.0 ppm	35.0 ppm	3 (0 days)	3 (0 days)	2 (0 days)	2 (0 days)
8-hour	9.0 ppm	9.5 ppm	2.0 (0 days)	2.0 (0 days)	1.5 (0 days)	1.4 (0 days)
Ozone						
1-hour	0.09 ppm	--	0.117 (2 days)	0.110 (3 days)	0.131 (6 days)	0.099 (2 days)
8-hour	0.07 ppm	0.075 ppm	0.087 (2 days)	0.097 (8 days)	0.094 (5 days)	0.078 (4 days)
Nitrogen dioxide						
1-hour	0.18 ppm	--	0.08 (0 days)	0.09 (0 days)	0.08 (0 days)	0.07 (0 days)
Annual	0.03 ppm	0.053 ppm	0.0200[a]	0.0184	0.017	0.016
Sulfur dioxide						
1-hour	0.25 ppm	--	0.02 (0 days)	0.02 (0 days)	0.02 (0 days)	0.026 (0 days)
24-hour	0.04 ppm	0.14 ppm	0.009 (0 days)	0.005 (0 days)	0.006 (0 days)	0.004 (0 days)
Annual	---	0.03 ppm	0.003 (0 days)	0.014 (0 days)	---	---
PM_{10}						
24-hour	50 µg/m^3	150 µg/m^3	96 (2 days)	50 (0 days)	52 (0 days)	37 (0 days)
Annual	20 µg/m^3	--	27.7	25.6	25.4	20.6
$PM_{2.5}$[b]						
24-hour	---	35 µg/m^3	68.0	57.2	63.0	35.0
Annual	12.0 µg/m^3	15.0 µg/m^3	13.7	14.2	13.0	10.5
Lead						
30-day	1.5 µg/m^3	--	0.02	0.01	0.01	0.01
Calendar Quarter	---	1.5 µg/m^3	0.01	0.01	0.01	0.01
Sulfates						
24-hour	25 µg/m^3	---	9.7 (0 days)	11.1 (0 days)	9.1 (0 days)	7.5 (0 days)

Source: SCAQMD 2011.
ppm - parts per million
µg/m^3 - microgram per cubic meter
[a] Less than 12 full months of data.
[b] Sulfur Dioxide, PM_{10} and $PM_{2.5}$ are not measured in the Northwest Coastal Los Angeles county Monitoring Station. Data are from the South Coastal Los Angeles county Monitoring Station

Greenhouse Gases

The California legislature concluded that global climate change poses significant adverse effects to the environment of the State and the world. In addition, the global scientific community has expressed a high confidence that climate change is anthropogenic (i.e., caused by humans) and that climate change could lead to adverse changes around the globe (IPCC 2007a).

Greenhouse gases (GHG) lead to the trapping and buildup of heat in the atmosphere near the earth's surface, commonly known as the greenhouse effect. The accumulation of GHG in the atmosphere regulates the earth's temperature. Emissions from human activities, such as electricity production and vehicle operation, have increased the emissions of these gases into the atmosphere. Emissions of GHG in excess of natural ambient concentrations are thought to be responsible for the enhancement of the

greenhouse effect and to contribute to climate change, a trend of unnatural warming of the earth's natural climate. Unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, GHG are global pollutants and climate change is a global issue.

Climate changes could lead to various changes in weather and rainfall patterns over time. According to CARB, potential climate change impacts in California may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CARB 2006b, 2007b). Several recent studies have explored the possible negative consequences of climate change in California. These reports acknowledge that climate scientists' understanding of the complex global climate system and the interplay of the various internal and external factors that affect climate change remain too limited to yield scientifically valid conclusions on such a localized scale. Substantial work at the national and international level has evaluated climatic impacts, but far less information is available on regional and local impacts.

GHGs include, but are not limited to, water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorocarbons. The warming potential of different types of greenhouse gases varies. The global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere. Since greenhouse gases absorb different amounts of heat, a common reference gas, CO_2, is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as CO_2 equivalent, or CO_2e. CO_2e is the amount of greenhouse gas emitted multiplied by the global warming potential. The global warming potential of CO_2 is therefore defined as 1. Methane has a global warming potential of 21; therefore, 1 pound of methane produce 21 pounds of CO_2e.

Table 3.7-4 shows a range of gasses that contribute to greenhouse gas warming with their associated global warming potential. The table also shows their estimated lifetime in the atmosphere and the range in global warming potential over 20, 100, and 500 years.

Table 3.7-4. Global Warming Potential of Various Gasses

Gas	Life in the Atmosphere (years)	20-year GWP (average)	100-year GWP (average)	500-year GWP (average)
Carbon Dioxide	50-200	1	1	1
Methane	12	21	56	6.5
Nitrous Oxide	120	310	280	170
HFC-23	264	11,700	9,100	9,800
HFC-125	32.6	2,800	4,600	920
HFC-134a	14.6	1,300	3,400	420
HFC-143a	48.3	3,800	5,000	1,400
HFC-152a	1.5	140	460	42
HFC-227ea	36.5	2,900	4,300	950
HFC-236fa	209	6,300	5,100	4,700
HFC-4310mee	17.1	1,300	3,000	400
CF4	50,000	6,500	4,400	10,000
C2F6	10,000	9,200	6,200	14,000
C4F10	2,600	7,000	4,800	10,100
C6F14	3,200	7,400	5,000	10,700
SF6	3,200	23,900	16,300	34,900

Source: USEPA 2007.
GWP - Global Warming Potential

The quantification of GHG emissions associated with a project can be complex and relies on a number of assumptions. Greenhouse gas emissions are generally classified as direct and indirect. Direct emissions are associated with the production of greenhouse gas emissions from the immediate project area. These include the combustion of natural gas as well as the combustion of fuel in engines and construction vehicles used on the site. In addition, direct emissions include fugitive emissions from valves and connections of equipment used during the implementation or throughout the life of the project. Indirect emissions include the emissions from vehicles (both gasoline and diesel) delivering materials and equipment to the site (e.g., haul trucks or barges).

Relationship Between Air Quality, Greenhouse Gas Emissions and Climate Change and Public Trust Resources and Values

Emissions generated during the implementation of the Project, including mid- to long-term emissions associated with backpassing and renourishment, have the potential to affect the public's right to safely enjoy public trust resources in the vicinity of the Project area as well as the Off-site Project areas. The public's right to access clean air within the public trust lands and waters is an important, contributing element for the public's enjoyment of activities in these locations.

3.7.2 Regulations Pertaining to the Public Trust

Federal, State, and local agencies have established standards and regulations that govern the Project. A summary of the regulatory setting for air quality is provided.

Federal

Clean Air Act

The Clean Air Act of 1970 directs attainment and maintenance of the NAAQS. The 1990 Amendments to this Act included new provisions that address air pollutant emissions that affect local, regional, and global air quality. The USEPA is responsible for implementing the Clean Air Act and establishing the NAAQS for criteria pollutants.

Air Quality Management Plan

Under the provisions of the Clean Air Act, the USEPA requires each state that has not attained the NAAQS to prepare an Air Quality Management Plan (AQMP), a separate local plan detailing how these standards are to be met. The California Lewis Air Quality Act of 1976 established the SCAQMD and mandated a planning process requiring preparation of an AQMP. The SCAQMD Governing Board adopted the 2007 AQMP in June of 2008. Proposed projects in the Basin are to be evaluated for conformity with the provisions of the 2007 Plan.

IMO MARPOL Annex VI

The International Maritime Organization (IMO) Marine Pollution (MARPOL) Annex VI, set new international nitrogen oxide (NO_x) emission limits on Category 3 (>1,831 cubic inches per cylinder displacement). For oceangoing vessel main propulsion engines (<130 revolutions per minute engine speed), the NO_x limits are approximately 6 percent less than the average emissions from pre-Annex VI ships.

Emission Standards for Non-road Diesel Engines

To reduce emissions from non-road diesel equipment, the USEPA has established a series of increasingly strict emission standards for new non-road diesel engines. These standards apply to construction equipment; however marine vessels are exempt.

Emission Standards for Marine Diesel Engines

The USEPA has established emission standards for new engines, referred to as Tier 2 marine engine standards. The Tier 2 standards were phased in between 2004 to 2007, depending on the engine size (USEPA 1999).

State

California Air Resources Board

The California Air Resources Board (CARB) established the CAAQS; comparing the criteria pollutant concentrations in ambient air to the CAAQS determines State attainment status for criteria pollutants in a given region. CARB has jurisdiction over all air pollutant sources in the State; however, it delegates responsibility for stationary sources to local air districts and retains authority over emissions from mobile sources.

California Clean Air Act

The California Clear Air Act (CCAA) went into effect in January 1, 1989, and was amended in 1992. The CCAA mandates achieving the health-based CAAQS at the earliest practical date.

California Diesel Fuel Regulations

With the California Diesel Fuel Regulations, the CARB set sulfur limitations for diesel fuel sold in California for use in on-road and off-road motor vehicles, including harbor craft and intrastate locomotives (CARB 2004, 2005c).

Measures to Reduce Emissions from Ship Auxiliary Engines

Ship auxiliary engines operating in California waters must use marine diesel oil (MDO) with a maximum of 0.5 percent sulfur by weight or use marine gas oil (MGO). Additionally, auxiliary engines operating in California waters must use another fuel (e.g., MGO with 0.1 percent sulfur by weight). In lieu of these requirements, alternative emission control strategies can be used provided they result in emissions of diesel PM, NO_x, and sulfur oxide (SO_x) from the auxiliary diesel engines that are no greater than the emissions that would have occurred with the aforementioned fuels.

Assembly Bill 1493

AB 1493 required CARB to develop and adopt the nation's first GHG emission standards for automobiles. CARB responded by adopting CO_2e fleet average emission standards. The standards will be phased in from 2009 to 2016, reducing emissions by 22 percent in the "near term" (2009 to 2012) and 30 percent in the "mid-term" (2013 to 2016), as compared to 2002 fleets.

Assembly Bill 32

AB 32 codifies the State's GHG emissions target and requires the State to reduce global warming emissions to 1990 levels by 2020 and directs the CARB to enforce the statewide cap that would begin phasing in by 2012.

California Air Resources Board: Interim Significance Thresholds

In October 2008, CARB released interim guidance on significance thresholds for industrial and residential projects (CARB 2008a). The draft proposal for industrial projects states that a project would not be significant if, with mitigation, it will emit no more than 7,000 metric tons CO_2e per year from non-transportation related sources and meet performance standards for construction and transportation emissions.

California Air Resources Board and SB 375

SB 375 (Steinberg) became effective January 1, 2009. This new law requires CARB to develop regional reduction targets for GHG, and prompts the creation of regional plans to reduce emissions from vehicle use throughout the state. California's 18 Metropolitan Planning Organizations (MPO) have been tasked with creating Sustainable Community Strategies (SCS). The MPO are required to develop the SCS through integrated land use and transportation planning and demonstrate an ability to attain the proposed reduction targets by 2020 and 2035.

The Southern California Association of Governments is the MPO for the Los Angeles area. They released recommendations for developing targets to the CARB in October, 2009 that recommended setting 2005 as the base year and using a per capita reduction metric, such as tons per person or household.

Local

Permits – Regulations II and III

SCAQMD Regulations II and III contain a series of rules specifying requirements and permit fees to construct and operate stationary equipment capable of emitting air contaminants, including air pollutant emission control equipment. Regulation II sets the general requirements for obtaining SCAQMD permits. Rules 201 through 203 require Permits to Construct and Permits to Operate. Rule 219 provides for exemptions from permit requirements under Regulation II. The exemptions of particular significance to the Project include Rule 219(a), Mobile Equipment; Rule 219 (b), Rule 219(d), Structures and Equipment (general); and Rule 219(e), General Utility Equipment.

Prohibitions – Regulation IV

Emission prohibitions (Regulation IV) define the allowable concentration and emission levels for pollutants from specific sources and activities, as well as inspection and maintenance requirements for sources of emissions. For example, Rule 402, Nuisance, prohibits discharge of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any such persons or the public; or

that cause, or have a natural tendency to cause, injury or damage to business or property.

Rule 403, Fugitive Dust, prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area that remain visible beyond the emission source property line. Best available control measures identified in the rule would be required to minimize fugitive dust emissions from unpaved areas. For landside Project construction staging areas, measures such as site watering and vehicle speed control on unpaved surfaces may be required.

New Source Review – Regulation XIII

Regulation XIII sets forth requirements to obtain permits to construct and permits to operate for new emission sources or modification of existing sources.

Toxics and Other Non-Criteria Pollutants – Regulation XIV

Regulation XIV specifies emission standards and emission control requirements for emissions of toxic and other non-criteria pollutants from specified sources.

3.7.3 Public Trust Impact Criteria

Criteria for determining the significance of air quality impacts are based on Federal, State, and local air pollution standards and regulations. Impacts on air quality are considered to be significant if the Project's emissions would:

- Increase ambient air pollution levels from below to above these standards;
- Contribute measurably to an existing or projected air quality violation; or
- Be inconsistent with measures contained in the applicable Air Quality Management/Attainment Plan.

Potential significant air quality impacts in the Basin are evaluated using SCAQMD criteria for measurable emissions, Project-related emission factors, and daily threshold levels from the Project's operation. These criteria are presented in Table 3.7-5.

Table 3.7-5. SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds		
Pollutant	**Construction, lb/day (kg/day)**	**Operation, lb/day (kg/day)**
NO_x	100	55
VOC	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_x	150	150
CO	550	550
Lead	3	3
Toxic Air Contaminants and Odor Thresholds		
TAC (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million, Cancer burden above 0.5, Hazard Index ≥ 1.0 (Project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants		
NO_2 1-hour average annual average	District is in attainment; Project is significant if it causes or contributes to an exceedance of the following attainment standards: • 0.03 ppm (Federal) • 0.18 ppm (State)	
PM_{10} 24-hour average annual	10.4 $\mu g/m^3$ (construction) 2.5 $\mu g/m^3$ (operation)	
$PM_{2.5}$ 24-hour average	10.4 $\mu g/m^3$ (construction) and 2.5 $\mu g/m^3$ (operation)	
Sulfate 24-hour average	1 $\mu g/m^3$	
CO 1-hour average 8-hour average	District is in attainment; Project is significant if it causes or contributes to an exceedance of the following attainment standards: • 9.0 ppm (State/Federal) • 20 ppm (State)	
Greenhouse Gas Emissions		
CO_2, N_20, CH_4, etc	If the Project's GHG emissions are less than or mitigated to less than 10,000 metric tons CO_2 equivalent per year the Project is presumed to be insignificant for GHG. If an existing project emits more than 10,000 metric tons of CO_2 per year, then any increases above the baseline level would be significant.	

3.7.4 Public Trust Impact Analysis

The Project would generate air emissions due to the following activities:

- Construction equipment and fugitive dust;
- Marine vessels to transport sand; and
- Vehicles commuting to and from the site.

Emissions are generated related to criteria pollutants for construction, greenhouse gasses, and toxic air contaminants. The following impact sections discuss each of these.

Impact AQ-1: Construction Impact on Air Quality

Construction activities would generate emissions that exceed South Coast Air Quality Management District thresholds for CO, NOx, PM_{10} and $PM_{2.5}$ (Substantial, Class S).

Impact Discussion

Operation of construction equipment with internal combustion engines (e.g., backhoes, cranes), offsite vehicles (e.g., construction employee vehicles; delivery trucks) and marine vessels would result in emission of criteria air pollutants (CO, ROC, NO_x, SO_2, and PM) during project implementation. Air emissions from construction equipment, including that used in dredging activities, were estimated using the emission factors from the URBEMIS software and the assumptions on the duration and personnel detailed in Section 2.0, *Project Description*. All machinery used in the Project would be equipped with appropriate mufflers and all engines would be regularly maintained.

NO_x emissions are a byproduct of combustion in engines, including construction equipment and vehicles. NO_x emissions from construction equipment can be reduced by using newer, cleaner engines. Combustion, particularly of diesel fuel, also produces PM emissions. However, a large portion of PM emissions during construction typically arises from large pieces of equipment traveling on disturbed soil, unpaved surfaces, and various earth-moving activities, such as trenching, grading, clearing, etc (called fugitive dust). These emissions mostly depend on the size of graded area, volume of moved soil, the number of construction machinery and vehicles, and the duration of construction. The Project fugitive dust PM_{10} emissions are estimated based on a disturbed area as provided by the Applicant. Dust control measures would be employed during construction activities, if necessary, and would include spraying water from tank trucks over exposed areas. Controlled emission factors were used from URBEMIS for calculation of the fugitive dust emissions. The detailed calculations are contained in Appendix G. Construction air emissions are summarized in Table 3.7-6.

Table 3.7-6. Project Construction Criteria Emissions

Activity	Peak Day Emissions (pounds/day)					
	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Activity						
Offshore Broad Beach Dredging	21.26	469.60	202.13	19.41	62.15	57.56
Offshore Broad Beach Dredging Sand Pumping	8.68	29.94	104.17	0.08	3.04	3.04
Onshore Broad Beach Dredging Sand Pumping and Spreading	26.00	107.21	247.01	0.20	9.84	9.84
Dockweiler Beach Dredging	6.38	186.63	57.98	8.07	24.90	22.99
Transport from Dockweiler Beach to Offshore Broad Beach	6.43	292.94	52.35	13.27	39.44	36.29
Ventura Dredging	5.81	184.69	48.14	8.06	24.71	22.79
Transport from Ventura to Offshore Broad Beach	6.42	292.28	52.23	13.24	39.35	36.21
Offshore Broad Beach - Dockweiler/Ventura Sand Pumping	0.90	3.12	10.85	0.01	0.32	0.32
Onshore Broad Beach - Dockweiler/Ventura Sand Pumping and Spreading	9.83	43.06	84.49	0.07	3.85	3.85
Offsite Emissions						
Offshore Broad Beach Dredging and Sand Pumping	0.01	0.37	0.04	0.00	0.00	0.00
Onshore Broad Beach Sand Pumping and Spreading	0.62	3.38	7.61	0.00	0.28	0.25
Dockweiler/Ventura Beach Dredging, Transport and Offshore Sand Pumping	0.01	0.37	0.04	0.00	0.00	0.00
Onshore Broad Beach - Dockweiler/Ventura Sand Pumping and Spreading	0.10	2.00	0.88	0.00	0.03	0.02
Total (Peak Day)	**56.58**	**610.49**	**560.96**	**19.70**	**75.31**	**70.70**
SCAQMD Regional Construction Thresholds (pounds/day)	75	550	100	150	150	55
SCAQMD Localized Construction Thresholds (pounds/day)	-	1,531	221	-	13	6
Significant Impact Regional?	No	**Yes**	**Yes**	No	No	**Yes**
Significant Impact Local (onsite emissions only according to SCAQMD lookup tables)?	No	No	**Yes**	No	**Yes**	**Yes**

Total construction emissions generated during the Project implementation would exceed SCAQMD thresholds on both a local and regional level for NO_x and $PM_{2.5}$. Construction emissions of CO would exceed the SCAQMD threshold for regional significance but not for local significance. Emissions of PM_{10} are expected to exceed thresholds for local significance but not for regional significance. Emissions of VOCs and SO_x, are not anticipated to exceed the SCAQMD regional emissions or local thresholds for pounds of pollutant generated each day (Table 3.7-6).

NO_x emission levels would exceed both regional and local threshold levels due to emissions associated with dredging, pumping, use of grading equipment and a relatively large number of marine vessel trips necessary for sand transport. Emissions of NO_x can be reduced by utilizing newer, cleaner diesel engines that meet USEPA Tier emissions requirements. However, based on the expectation that the Project would exceed the SCAQMD NO_x threshold of 100 lbs/day by 460.96 lbs/day, it is anticipated that the Project's construction-related emissions would continue to exceed the SCAQMD NO_x threshold even with use of newer technologies described in AMM AQ-1b below. Therefore, impacts from NO_x emissions would be potentially substantial.

$PM_{2.5}$ and PM_{10} emissions are emitted as a fraction of total PM emissions. Emissions of $PM_{2.5}$ would exceed both SCAQMD local and regional thresholds. Emissions of PM_{10} would exceed only the SCAQMD threshold for local impact significance. Emissions of both PM sizes are associated with fugitive dust due to sand spreading activities and vehicle and construction equipment combustion. PM emissions associated with fugitive dust can be reduced by implementing measures such as watering, maintaining a level of soil moisture and reducing vehicle speeds, and treating roadways, thereby reducing dust generation. These measures are common practice at construction sites and are described in the AMMs below, along with the estimated reduction in PM emissions for each measure. Although SCAQMD Rule 403 requires a fugitive dust control plan, the specifics of the plan are left to the Applicant and the SCAQMD. The fugitive dust control plan should include but not be limited to the measures outlined below in AMM AQ-1a and AMM AQ-1b. Although these measures would ensure dust emissions of both $PM_{2.5}$ and PM_{10} are reduced to the maximum extent feasible, emissions may still exceed SCAQMD thresholds. Therefore, emissions of $PM_{2.5}$ would be potentially substantial at the local and regional scale and PM_{10} emissions would be potentially substantial at the local level.

Increased CO emissions would be generated from Project-related traffic and use of heavy construction equipment during Project implementation. A common concern with increased levels of CO emissions is the generation of CO hotspots. These often develop in areas with high vehicle density, such as congested intersections or low level of service intersections. Emissions of CO from total Project construction are anticipated to exceed the SCAQMD local threshold of significance and would therefore be potentially substantial at the local level during construction.

Avoidance and Minimization Measures

AMM AQ-1a: Fugitive Dust Control. The Applicant shall submit and implement a Fugitive Dust Control Plan that includes Southern California Air Quality Management District (SCAQMD) mitigations for fugitive dust mitigation, according to Rule 403. The Plan shall also address fugitive dust measure impacts to native habitats. Fugitive dust mitigation measures in the plan should include the following:

- Require minimum soil moisture of 12 percent for earthmoving, by using a moveable sprinkler system or water truck. Moisture content can be verified by lab sample or moisture probe (69 percent reduction).
- Limit on-site vehicle speeds roads to 15 miles per hour (mph) with radar enforcement (57 percent reduction) and posting of speed limits.
- All trucks hauling sand and other loose materials are to be tarped with a fabric cover and maintain a freeboard height of 12 inches (91 percent reduction).
- Water storage piles by hand or apply cover when wind events are declared, according to SCAQMD Rule 403 when instantaneous wind speeds exceed 25 mph (90 percent reduction).
- Appoint a construction relations officer to act as a community liaison concerning onsite construction issues, such as dust generation.

AMM AQ-1b: NO_x/PM Control. The Applicant shall implement a NO_x reduction program including the following, or equivalent, measures:

- All off-road construction equipment shall be tuned and maintained according to manufacturers' specifications.
- Any temporary electric power shall be obtained from the electrical grid, rather than portable diesel or gasoline generators.
- All off-road diesel construction equipment with greater than 100-horsepower engines shall meet Tier 4 requirements. If the Lead Agency determines that a Tier 4 fleet or portion thereof cannot be obtained, the Lead Agency shall require the use of construction equipment that meets Tier 3 emissions requirements or utilize other California Air Resources Board (CARB)-verified emission control technologies to achieve the same level of emission reduction.
- Limit onsite truck idling to less than 5 minutes.
- A copy of the certified tier specification, best available control technology documentation, or the CARB or Southern California Air

Quality Management District operating permit for each piece of equipment shall be provided when each piece of equipment is mobilized.

Rationale for Avoidance and Minimization Measures

Reductions in NO_x and PM emissions would reduce but not eliminate potential impacts on local and regional air quality and would help protect public health.

Impact AQ-2: Construction Impact of Greenhouse Gas Emissions

Potential beach enhancement activities would increase greenhouse gas emissions (Unsubstantial, Class U).

Impact Discussion

Mining, transport and placement of sand as part of beach nourishment activities would result in emissions of greenhouse gases. GHG emissions were estimated utilizing the equipment size and fuel use data that were used to estimate criteria emissions along with emission factors as defined by the CARB and the USEPA (see Appendix G for the detailed calculations). GHG associated with operations include emissions from combustion sources (construction equipment and vessel engines), offsite vehicles, electrical generation, and fugitive emissions that contain CO_2 and methane. The largest source of GHG emissions are associated with dredging and sand pumping followed by sand transport.

Emissions associated with all equipment, including mobile sources, as shown in Table 3.7-7, would not exceed the SCAQMD threshold of 10,000 tons per year. Therefore, potential impacts to Public Trust resources would not be substantial.

Table 3.7-7. Project Construction GHG Emissions

Activity	Peak Day Emissions (pounds/day)			
	N_2O	CH_4	CO_2	CO_2e (tons)
Activity				
Offshore Broad Beach Dredging	0.01	0.09	653	595
Offshore Broad Beach Dredging Sand Pumping	0.00	0.01	66	60
Onshore Broad Beach Dredging Sand Pumping and Spreading	0.00	0.02	158	144
Dockweiler Beach Dredging	0.02	0.22	1,641	1,496
Transport from Dockweiler Beach to Offshore Broad Beach	0.02	0.35	2,528	2,305
Ventura Dredging	0.02	0.22	1,614	1,471
Transport from Ventura to Offshore Broad Beach	0.02	0.35	2,522	2,299
Offshore Broad Beach - Dockweiler/Ventura Sand Pumping	0.00	0.00	44	40
Onshore Broad Beach - Dockweiler/Ventura Sand Pumping and Spreading	0.00	0.04	351	320
Offsite Emissions				
Offshore Broad Beach Dredging and Sand Pumping	0.00	0.00	0.36	0.34
Onshore Broad Beach Sand Pumping and Spreading	0.00	0.00	2.95	2.76
Dockweiler/Ventura Beach Dredging, Transport and Offshore Sand Pumping	0.00	0.00	2.31	2.19
Onshore Broad Beach - Dockweiler/Ventura Sand Pumping and Spreading	0.00	0.01	15.71	14.74
Total (tons)	**0.05**	**0.73**	**5,464**	**4,981**

Impact AQ-3: Construction Toxic Pollutant Emissions and Potential Health Risk

Construction activities would generate emissions of toxic air contaminants that would potentially impact human health (Unsubstantial with Implementation of Avoidance and Minimization Measures, Class UI).

Impact Discussion

According to AB 2588, health risk assessments (HRA) are required for facilities that emit toxic pollutants above a threshold criteria level. Based on SCAQMD annual emission reporting requirements, Project emissions sources would be exempt. Although the SCAQMD Rule 301 reporting requirement does not include mobile sources and temporary equipment (e.g., construction equipment and marine vessels), they have been included to provide a comparison of these emissions to the reporting thresholds.

As part of this analysis, a HRA was conducted using the CARB Hotspots Analysis and Reporting Program (HARP) model. HARP is a computer software package that combines the tools of emission inventory database, facility prioritization, air dispersion

modeling, and risk assessment analysis. All of these tools are tied to a single database allowing sharing and utilizations of information.

The Office of Environmental Health Hazard Assessment (OEHHA) document Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments outlines the risk assessment methods and procedures (OEHHA 2003).

It was assumed that all offsite individuals would experience a lifetime exposure (i.e., 70 years under the SCAQMD and OEHHA risk assessment guidelines) for operations and dredging. Two emission scenarios were evaluated in the analysis: a 70-year average emissions profile to estimate lifetime cancer risk, and a peak emissions year that was assumed to persist for 70 years to evaluate the SCAQMD's criteria limiting the risk per year to 1/70 of the maximum allowable risk. Since beach enhancement activities would only occur over a 6-month period per enhancement, the maximum emissions scenario represents a very conservative estimate of potential health risk.

Overall, the worst-case health risk associated with beach enhancement could potentially exceed applicable health risk criteria for individual cancer risk. Based on the health risk assessment modeling results, potential health risks would be considered potentially significant with the peak annual excess cancer risk exceeding 10 in one million at several locations. Sources that contributed the greatest to the health risk levels mainly included diesel engines, especially those associated at the borrow sites and offshore pumping and sand-spreading activities at Broad Beach.

Emissions of toxic materials can be reduced by limiting operations near sensitive receptors and installing devices on diesel engines that reduce emissions of toxic materials. These devices are verified and registered by the CARB and are commonly used on diesel engines throughout industry to reduce diesel particulate matter, the main toxic component of diesel exhaust.

Avoidance and Minimization Measures

Several measures have been identified as part of the air quality analysis. These measures, including AMM AQ-1a and AMM AQ-1b, would reduce emissions of toxic air contaminants. However, the following mitigation measures would also be required to minimize levels of public health risk.

AMM AQ-3a: Diesel Particulate Emission Controls. The Applicant shall install California Air Resources Board (CARB)-verified Level 3 diesel catalysts on all diesel-powered off-road equipment and marine vessels or utilize diesel engines that have an equivalent particulate matter (PM) emission rate (Tier 4 engines). The current list of CARB-verified Level 3 diesel catalysts is available from http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm. Catalysts or

engine certifications shall demonstrate achieving 85 percent reduction for diesel PM.

Rationale for Avoidance and Minimization Measures

Diesel catalysts are widely used to reduce emissions from diesel engines. CARB recommends diesel catalysts as part of their ongoing Airborne Toxic Control Measures and maintains a list of certifications of applicable technologies. CARB has evaluated various types of control options for diesel particulate and identified the control efficiency, cost, and source test data. CARB found that the most effective control technologies are catalyst-based diesel particulate filters. CARB requires diesel catalyst manufacturers to certify that they can achieve the required reduction levels. Reductions in potential diesel particulate emissions would minimize potential health risks. Reductions in diesel particulate emissions would reduce the potential excess cancer risk to a level that is less than the SCAQMD significance threshold.

Table 3.7-8. Summary of Air Quality, Greenhouse Gases and Climate Change Impacts and Avoidance and Minimization Measures

Impact	Avoidance and Minimization Measures
AQ-1: Construction Impact on Air Quality	**AMM AQ-1a.** Fugitive Dust Emission Controls **AMM AQ-1b.** NO_x/PM Emission Controls
AQ-2: Construction Impact of Greenhouse Gas Emissions	No AMMs recommended
AQ-3: Construction Toxic Pollutant Emissions and Potential Health Risk	**AMM AQ-3a.** Diesel Particulate Emission Controls